DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al. (N. Golmie et al., "A Differentiated Optical Services Model for WDM Networks", IEEE Communications Magazine, February 2000) in view of Jukan et al. (A. Jukan et al., "Constraint-based Path Selection Methods for On-demand Provisioning in WDM Networks", IEEE INFOCOM 2002, 23-27 June 2002) and Desnoyers et al. (U.S. Patent 6,791,948 B1).

Regarding claims 1, 14, 18 and 31, Golmie et al. teaches in FIG. 3 and Table 1 to divide a WDM network into separate service levels. The difference between Golmie et al. and the claimed invention is that Golmie et al. does not teach how to determine service level topology. Jukan et al. teaches on page 827 left col. continuity constraints. Jukan et al. teaches on page 831 right col. distributed discovery of wavelength paths by each access node. One of ordinary skill in the art would have been motivated to combine the teaching of Jukan et al. with the WDM network of Golmie et al. because the method of Jukan et al. allow automatic discovery of network topology in a mesh network. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the decentralized network topology discovery method, as taught by Jukan et al., in the WDM network of Golmie et al.

The combination of Golmie et al. and Jukan et al. still fails to teach to use available wavelength for determining network topology. However, it is obvious to one of ordinary skill in

the art that the method of Jukan et al. can be used to discovered network topology. For example, Desnoyers et al. teaches in col. 2, lines 56-65 to use request message to discover network topology. For network topology discovery, one of ordinary skill in the art would have used all available wavelengths instead of the idle wavelengths. One of ordinary skill in the art would have been motivated to combine the teaching of Desnoyers et al. with the modified WDM network of Golmie et al. and Jukan et al. because using request message requires less processing power and information storage capacity as compared with conventional method such as OSPF. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the probing method of Jukan et al. for topology discovery as suggested by Desnoyers et al. because using request message requires less processing power and information storage capacity as compared with conventional method such as OSPF.

Regarding claim 2, 19 and 32, Golmie et al. teaches in Table 1 BER.

Regarding claim 3, the modified method of Golmie et al., Jukan et al. and Desnoyers et al. determines service level network topology.

Regarding claims 5-6 and 15, Jukan et al. teaches on page 827, left col. wavelength continuity constraints.

Regarding claim 7, Desnoyers et al. teaches in col. 19, lines that the same method can be used for determine changes for maintaining network topology.

Regarding claim 8, Golmie et al. teaches in Table 1 BER and other service level parameters.

Regarding claim 20 and 23, Jukan et al. teaches on page 828, left col. service-specific wavelength set.

Regarding claim 24, Desnoyers et al. teaches in FIG. 2 network topology database 33.

Regarding claim 25, Golmie et al. teaches in Table 1 BER and other service level parameters.

Regarding claims 26-27, the modified method of Golmie et al., Jukan et al. and Desnoyers et al. determines service level network topology.

Regarding claim 34, Jukan et al. teaches comparing service-specific wavelength sets.

Regarding claims 35-36, the modified method of Golmie et al., Jukan et al. and Desnoyers et al. determines service level network topology by sending message to find reachable paths.

Regarding claim 37, Desnoyers et al. teaches in FIG. 2 processor and system memory. It is well known to one of ordinary skill in the art that instructions for controlling the processor can be stored in memory.

Regarding claim 38, Golmie et al. teaches in Table 1 BER and other service level parameters.

Regarding claim 40, Jukan et al. teaches comparing service-specific wavelength sets.

Regarding claims 41-42, the modified method of Golmie et al., Jukan et al. and Desnoyers et al. determines service level network topology by sending message to find reachable paths.

Regarding claims 43-46, Jukan et al. teaches real-time path setup.

Regarding claim 49, Jukan et al. teaches on page 827, left col. wavelength continuity constraints.

Regarding claim 50, Desnoyers et al. teaches in FIG. 2 processor and system memory. It is well known to one of ordinary skill in the art that instructions for controlling the processor can be stored in memory.

Regarding claims 51-53, Jukan et al. teaches real-time path setup.

Regarding claim 56, Jukan et al. teaches on page 827, left col. wavelength continuity constraints.

Regarding claims 71-72, Desnoyers et al. teaches in FIG. 2 network topology database 33.

3. Claims 9, 33, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Lang et al. (Lang et al., "Link Management Protocol", draft-ietf-mpls-lmp-02.txt, 2001).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach link management protocol. Link management protocol is well known in the art for tracking link status of links between adjacent nodes. Lang et al. teaches the details of a link management protocol (LMP). One of ordinary skill in the art would have been motivated to combine the teaching of Lang et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because LMP provides verification, link property correlation and fault management functions for managing links. Thus it would have been obvious to one of ordinary skill in the art at the time the

invention was made to use LMP for managing links, as taught by Lang et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because LMP provides verification, link property correlation and fault management functions for managing links.

4. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Okajima et al. (U.S. Patent Application Pub. 2002/0120766 A1).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach comparing parameters of links with service level parameters. Okajima et al. further teaches in FIG. 5 to monitor variable link metrics to determine whether link metrics have been changed and update link metrics accordingly. One of ordinary skill in the art would have been motivated to combine the teaching of Okajima et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a link must meet service level criteria for providing the associated QoS. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to compare link parameters with classification criteria, as taught by Okajima et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a link must meet service level criteria for providing the associated QoS.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38,

40-46, 49-53, 56 and 71-72 above, and further in view of Matsuura et al. (U.S. Patent Application Pub. 2003/0198227 A1).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach to use number of wavelength conversion as criteria. Matsuura et al. teaches in paragraphs [0014] and [0017] that wavelength conversion devices are expensive and the number of wavelength conversion is kept to a minimum in setting up a lightpath. One of ordinary skill in the art would have been motivated to combine the teaching of Matsuura et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. to limit the number of wavelength conversion used because wavelength conversion devices are expensive and a OXC can have only limited number of wavelength conversion devices to be shared for all lightpaths. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use number of wavelength conversions as a criteria for service level, as taught by Matsuura et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. to limit the number of wavelength conversions used because wavelength conversion devices are expensive and a OXC can have only limited number of wavelength conversion devices to be shared for all lightpaths.

6. Claims 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Battou et al. (U.S. Patent 7,013,084 B2).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach a centralized network management server. Battou et al. teaches in FIG. 30 network management system (NMS) for managing a network. Battou et al. teaches in FIG. 34 topology manager of NMS for providing a topological view of the network. One of ordinary skill in the art would have been motivated to combine the teaching of Battou et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a NMS provides a topological view of the network to craftsperson for operation and maintenance. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a NMS, as taught by Battou et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a NMS provides a topological view of the network to craftsperson for operation and maintenance.

7. Claims 30 and 57-60, 62-67, 69-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Melaku et al. (U.S. Patent Application Pub. 2003/0074443 A1).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach to change service level. Melaku et al. teaches in FIG. 5 QoS broker for handling service level change request. Melaku et al. teaches in

paragraph. [0056] that if a user decides to change QoS requirements in the midst of a session, new resources are to be reallocated and a new path that meets the requested QoS is established. One of ordinary skill in the art would have been motivated to combine the teaching of Melaku et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a QoS broker allows users to change service level depending on changes of their application needs. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a QoS broker for handling service level change requests, as taught by Melaku et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a QoS broker allows users to change service level depending on changes of their application needs.

8. Claims 74-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Deo ("Graph Theory with Applications to Engineering and Computer Science" by N. Deo, Prentice-Hall, 1974, pp. 137-144).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach to use a table or a tree to represent service level topology. Networks are mathematically represented as graphs. Deo teaches in chapter 7 to represent graphs as matrix (or table). One of ordinary skill in the art would have been motivated to combine the teaching of Deo with the modified machine-readable medium of Golmie et al., Jukan et al. and Desnoyers et al. to represent network as matrix because matrices are better for

computer processing. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to represent service level topology structures as table, as taught by Deo, in the modified machine-readable medium of Golmie et al., Jukan et al. and Desnoyers et al.

Response to Arguments

9. Applicant's arguments filed 15 January 2010 have been fully considered but they are not persuasive.

The Applicant argues "Jukan does not disclose "determining service level topologies ... said each service level topology comprises end to end paths satisfying the corresponding service level from that access node to all other reachable access nodes in said optical network as destinations." Furthermore, because Desnoyers does not teach or suggest service levels, Desnoyers cannot teach or suggest the claim element. Thus, none of Golmie, Jukan, or Desnoyers teaches or suggests "determining service level topologies ... said each service level topology comprises end to end paths satisfying the corresponding service level from that access node to all other reachable access nodes in said optical network as destinations. ""

10. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The Applicant argues "the Examiner does not cite any section Golmie, Jukan, or Desnoyers that discuss the particular structure of the network topology database. Thus, the Examiner has not demonstrated how any of Golmie, Jukan, or Desnoyers teaches or suggests

Applicants' particular claimed structure for service level topologies stored in a service level connectivity database."

As recited in claim 1, the network topology database stores end-to-end paths. The combination of Golmie, Jukan and Desnoyers clearly teach storing end-to-end paths.

The Applicant argues "In addition, storing service level topology structures that references a set of end to end paths satisfying the corresponding service level is not obvious to one of skill in the art. In order to support an obvious rejection, the Examiner must show that the difference between the prior art cited and the claimed invention would have been obvious to one of skill in the art (Fed. Reg. Vol. 72, No. 195, p. 57528). One example of one of skill in the art can be found in the well-known Open Shortest Path First (OSPF) protocol. OSPF databases and Shortest Path First (SPF) trees that are not portioned into separate structures based on service level. It should be noted that the since OSPF is a protocol typically used in optically networking to create topology databases, Moy would be considered one of skill in the art. Furthermore, even though it may have known at the time of Moy that a database may be organized in a different fashion, Moy (and others who use OSPF) chose to organize the topology database as a link/lambda state database and/or a link/lambda SPF tree, instead of a topology database with partitioned based on service level. Thus, because Moy organized the OSPF database(s) differently than Applicant's topology database and Moy is one of skill in the art, it would not have been obvious to one of skill in the art to try to store separate service level topology structures that reference a set of end to end paths satisfying the corresponding service level."

It appears that the Applicant misinterprets the law to read "A patent may be obtained if the invention is not obvious to one of ordinary skill in the art." However, the law states "A

patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made." Furthermore, the rejection in the Office Action is not based on Moy. Therefore, the Applicant's argument is not persuasive.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (6:30 a.m. - 4:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

skl
4 April 2010

/Shi K. Li/
Primary Examiner, Art Unit 2613